SUPPORT FOR AMENDMENTS

Claims 1 and 13 are amended for clarity. Support for these amendments can be found in the specification at page 9, lines 2-11.

Claims 21-28 are newly added. Support for these claims can be found in the specification at page 11, line 9 through page 13, line 11.

No new matter has been added.

REMARKS/ARGUMENTS

The rejection of Claims 1, 5, and 8-12 under 35 U.S.C. § 102(e) or alternatively 35 U.S.C. § 103(a) in view of U.S. Patent 6,596,437 (**Yoon et al.**) is respectfully traversed. The cited reference does not disclose anode materials having graphite powders having a reduced mesopore volume and interior portions of fine pores coated with a carbonized material of thermoplastic resin. As disclosed in the present application, a mesopore volume of 0.01 cc/g or less is required to improve the irreversible capacity of anodes. As a result, the cited reference does not disclose anodes having irreversible capacities of less than 45 mAh/g.

The Examiner asserts (with emphasis added):

> "that the other properties of the anode material of Yoon et al., ***such as the mesopore volume***, standard deviation of particle size, rate of oxidation loss, specific surface area, H/C value, L(112) spacing, accumulative pore volume difference, and change in mesopore volume due to coating, ***are inherent***, given that the anode material of Yoon et al. and the present application ***have similar process steps***, the peak strength ratios (I_{360}/I_{580}), interlayer spacings d_{002}, and precursor materials. "

However, **Yoon et al.** discloses different processes of making anode materials from those disclosed in the present application. The cited reference states (with emphasis added):

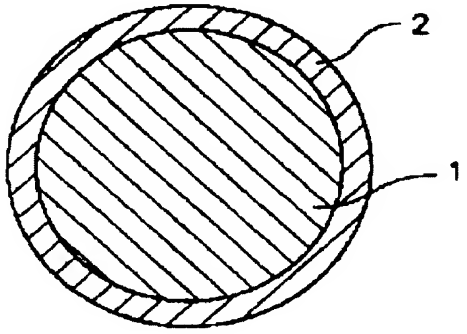
> "During the reflux reaction, a variety of functional groups such as a hydroxy group and a hydroxyl carbon or carboxyl group, present on an edge of the crystalline carbon material, ***are condensation-reacted*** (e.g., ether combination) with a functional

> group present in the amorphous carbon precursor such that a combination material of the crystalline carbon and the amorphous carbon precursor is formed."

The result of this "condensation-reacted" is (with emphasis added):

> "[an] active material ..[that]... comprises a crystalline carbon core 1, and an amorphous carbon or a turbostratic structure carbon shell 2 ***evenly covering the crystalline carbon core 1***."

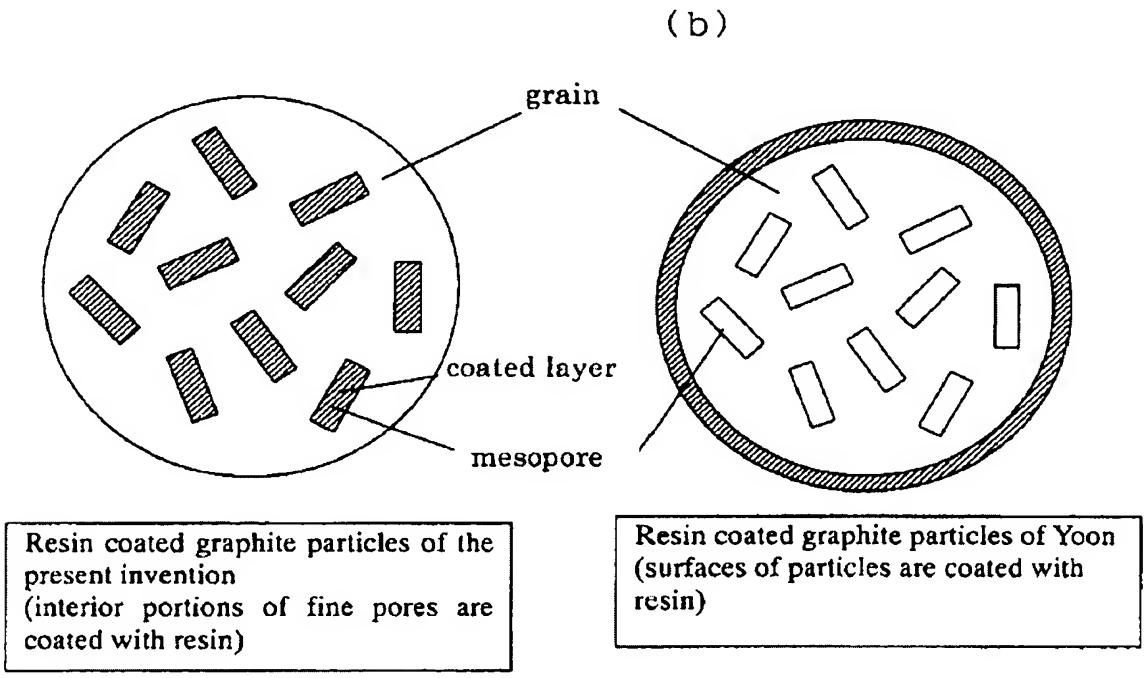
That is, the coating described in the cited reference is the chemical bonding of a carbon precursor to ***evenly*** coat a surface of the crystalline carbon. The cited reference contains no disclosure that mesopores are present in the crystalline carbon. Thus, this "evenly" covering is located to an outer surface of this core. This reference contains no disclosure that mesopore surfaces are coated. The coating disclosed in the cited reference is shown in the graphic displayed below, where a similar graphic appears in Japanese Patent Publication 1999-329436. Here, the outer surface of the crystalline carbon core (1) is coated with the amorphous or turbostratic carbon shell (2).



1: crystalline carbon core
2: amorphous carbon shell or turbostratic carbon shell

In contrast, in making the presently claimed anode materials, dry graphite powder is dry blended with a dry resin powder. Thus, the "condensation-reacted" of **Yoon et al.** does not occur in the method of making the graphite powders of the present claims. The result of this dry blending is that, for the graphite particles used in the present invention, the ***interior***

portions of the fine pores of the graphite particles are coated with resin. Thus, the mesopore volumes of graphite particles in the presently claimed anode materials are reduced, which results in superior performance in irreversible capacities. This reduction in volume is shown in the graphic below, which compares the graphite particles of the present disclosure (a) and of **Yoon et al.** (b). Interior pores within the graphite powders of the presently claimed anodes are coated with resin, while the interior pores in the corresponding graphite particles of **Yoon et al.** are not coated.



The result of coating the interior pores of graphite particles of the presently claimed anode materials is a reduction in the mesopore volume of these pores. As a result, the presently claimed anodes display irreversible capacities ranging from 28.2 to 43.6 mAh/g[1] while the anodes disclosed in **Yoon et al.** display irreversible capacities of 45.2 to 142.9

[1] See Fig. 1 of present application.

mAh/g.[2] This reduction in mesopore volume to improve battery characteristics is one aspect of an invention disclosed in the present application:[3]

> "Since the mesopore volume is reduced to 0.01 cc/g or less by coating the graphite powder with the carbonized material of thermoplastic resin, the irreversible capacity resulting from the decomposition of the electrolytic solution can be reduced. When the mesopore volume is more than 0.01 cc/g, the irreversible capacity cannot be improved."

Therefore, one of skill in the art would not be taught to make the presently claimed anode materials containing graphite powders with reduced mesopore volumes based on the disclosure of **Yoon et al**.

Accordingly, the rejection should be withdrawn.

The rejection of Claims 13-20 under 35 U.S.C. § 103(a) in view of **Yoon et al.** in view of Japanese Patent Publication 2001-196097 (**Aihara et al.**) is respectfully traversed. Like **Yoon et al., Aihara et al.** discloses methods for making anode materials where mixing of graphite particles occurs by wet blending. However, no indication is given that these graphite powders are coated with a resin in **Aihara et al**. Therefore, one of skill in the art would not be motivated to make the presently claimed anode materials containing a mixture of graphite powders each with reduced mesopore volumes based on the disclosure of **Yoon et al**. and **Aihara et al.** for reasons similar to those discussed above.

Accordingly, the rejection should be withdrawn.

The rejection of Claims 13-20 under 35 U.S.C. § 112, second paragraph, is obviated by appropriate amendment to the claims. Accordingly, the rejection should be withdrawn.

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[2] See Table 2 of Yoon et al.
[3] See page 5, lines 10-14 of present application.

Applicants submit that the present application is in condition for allowance.

Notification thereof is earnestly solicited.

Respectfully submitted,

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